

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
6 January 2005 (06.01.2005)

PCT

(10) International Publication Number
WO 2005/001981 A2

(51) International Patent Classification⁷:

H01M 8/18

(74) Agent: HILL & SCHUMACHER; 87 Falcon Street, Toronto, Ontario M4S2P4 (CA).

(21) International Application Number:

PCT/CA2004/000943

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(22) International Filing Date: 25 June 2004 (25.06.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/482,765 27 June 2003 (27.06.2003) US

(71) Applicant (for all designated States except US): THE UNIVERSITY OF WESTERN ONTARIO [CA/CA]; 2-1151 Richmond Street, London, Ontario N6A 5B8 (CA).

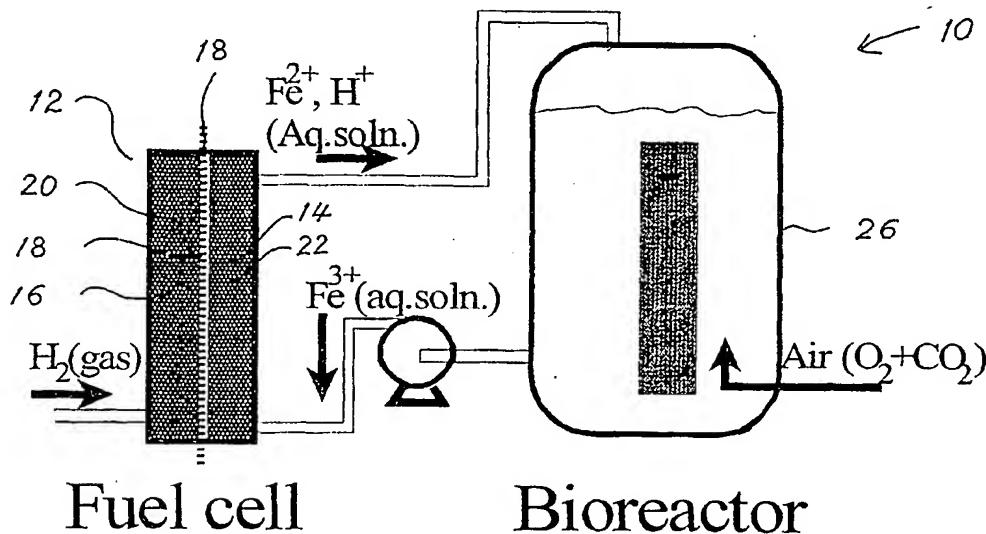
(72) Inventor; and

(75) Inventor/Applicant (for US only): KARAMANEV, Dimitre [CA/CA]; 62 Finsbury Crescent, London, Ontario N6G 2B4 (CA).

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: BIOFUEL CELL



WO 2005/001981 A2

(57) Abstract: The present invention discloses a new type of biofuel cell, based on the microbial regeneration of the oxidant, ferric ions. The bio-fuel cell is based on the cathodic reduction of ferric to ferrous ions, coupled with the microbial regeneration of ferric ions by the oxidation of ferrous ions, with fuel (such as hydrogen) oxidation on the anode. The microbial regeneration of ferric ions is achieved by chemolithotrophic microorganisms such as *Acidithiobacillus ferrooxidans*. Electrical generation is coupled with the consumption of carbon dioxide from atmosphere and its transformation into microbial cells, which can be used as a single-cell protein.



Published:

- *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.